

Effect of modified *Sattu* on health status of children in Godda district of Jharkhand state

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The children are the building blocks of any economy. If they will be healthy, the whole nation will be healthy. It is well known saying that a healthy body have a healthy mind. If we talk in terms of the nutrition, a nutritionally balanced physique is the basis of a sound personality. Thus it can be understood very easily that nutrition plays a great role in the overall development. Therefore, keeping the above facts in mind, a study was conducted in Godda district to see the effect of modified local food- *Sattu* on the health status of the children. The results showed that the modified *Sattu* had a very positive effect on the health status on the children in comparison to the local practice. The modified *Sattu* was given in different combinations of locally available agricultural grain crops like maize, bajra and soyabean with gram. The children selected for the study belonged to age group of 4-7 years. The results indicate that if locally prepared *Sattu* prepare with maize, barley and specially with soybean, it has more nutritive value instead the local practice (*Sattu* made only with gram) and thus it will help to combat the problem of malnutrition to a greater extent.

Key Words : *Sattu*, Children, Malnutrition, Health status

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INTRODUCTION

Children are the future building blocks of any economy. If, they will be healthy, the whole nation will be healthy. It is well known saying that a healthy body have a healthy mind. If we talk in terms of the nutrition, a nutritionally balanced physique is the basis of a sound personality. Thus it can be understood very easily that nutrition plays a great role in the overall development.

But generally it is seen that children are the chief victims of the malnutrition and health problems like, underweight, overweight, nutritional disorders, micro-nutrient deficiency etc. Prof. Amartya Sen has rightly described the nutritional status of children under-5 years as the most sensitive indicator of development of a particular area.

According to recent scientific evidences malnutrition is directly or indirectly related to 60 per cent of all deaths among children under five years annually. Over 2/3 of these deaths

are often associated with inappropriate feeding practices and occur during the first year of life. The overall development of the children (cognitive, social, educational, and personal) depends a lot the early infancy and childhood feeding practices. If the feeding practices will be poor, definitively it will affect the future development of the child. In other words, we can say that if a feeding quality and quantity is not good, the overall health status of the child will be affected.

When we talk about the Indian children, despite the continuous progress in health and nutrition services, still the malnutrition problem in India is a major challenge before the country.

As a result the magnitude of the problem of malnutrition and poor health indicators like infant mortality rate, under 5 mortality rate and maternal mortality rate in the country are higher than some of the developing countries of the South East Asia. (Report of the Working group on Integrating Nutrition with Health, 11th Five Year Plan).

Malnutrition contributes to 60 per cent of the 10 million deaths globally that occur every year among children under five years of age. Its contribution to child deaths is even higher during first six months of life, when mortality is highest.

According to some studies, the shady side of the effects

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of restricted nutrition during early years also affects the normal metabolic functions of the individuals which persist during later life as well (McCance and Widdowson, 1974; Widdowson and McCance, 1963). There is generally a very high correlation between the heights of an individual during childhood and the adulthood (Martorell *et al.*, 1992). It reflects that the malnutrition during early years results in irreversible changes in the body of the child which becomes apparent later on. Under nutrition in its initial phases remains latent in its effects but shows itself later on with serious effects (Bogin, 1996; Golden, 1996; Ulijaszek, 1996; Widdowson, 1962; Wootton and Jackson, 1996). The clinical deficiency signs of malnutrition appear only when the effects have reached serious levels (Gopalan *et al.*, 1989). The most prevalent nutritional deficiencies occurring in Indian children are protein energy malnutrition (PEM), vitamin A deficiency, iron deficiency anaemia and iodine deficiency which are named as “big four” and are the major concern of the health authorities in India (Gopalan *et al.*, 1989). So, keeping all these points in mind, an on farm trial was designed to study the impact of modified local food-*Sattu* on the health status on the children.

METHODOLOGY

An on farm trial was conducted on twenty children. The selected children belong to the age group of 4-7 years. The total children were divided on four groups, each group having 5 children. the first group receive the local practice based prepared *Sattu* and remaining three group of children received modified *Sattu* which is in different combinations of the maize, barley and soybean with gram.

Selection of children:

For selection of the children for the trial height and weight chart recommended by ICMR was followed. Those children who were below the standard height and weight were selected for the on farm trial. It was also considered that the children should be regular. So the help of the aaganwadi worker was taken to select the children who was regular to aaganwadi.

Place of trial:

The trial was conducted in the aaganwadi centre because it was nearest to the GVT KVK and also the daily and regular monitoring of the trial was easy.

Time period of the trial:

The OFT was conducted for the three months, *i.e.* from February, 2011 to October, 2011.

Procedure:

First of all, a meeting with the mothers of the beneficiary children was conducted with the help of the aaganwadi worker

to discuss about the trial and its benefit. With consent of the villagers, the trial was started. First the height and weight of the children was taken to select them for the study, followed by taking the blood sample to know about the protein content of the selected beneficiary children before introducing the intervention- modified *Sattu*.

After taking the blood sample and testing, the modified *Sattu* was introduced to the selected beneficiary children. Daily about 60-70 g of the modified *Sattu* was given to the children in the form of freshly and at the spot prepared laddu.

OBSERVATIONS AND ASSESSMENT

Table 1 shows mean value of the blood protein of the beneficiary children. It can be easily concluded from the Table 1 that the value of the blood protein was increased after intervening the trial to the children. This show the trend that the locally available food if supplemented with cheap, nutritionally rich and locally available agricultural grains crops like maize, barley and especially with soybean etc., it will definitely improve the health status of the children.

Each group had five children. The first group was received *Sattu* which was made with gram only as it was in local practice to consume the *Sattu* which was totally prepared by only gram. The second group children were fed the *Sattu* prepared with the combination of gram and maize. The third group of the children gave *Sattu* prepared with gram, maize and soybean. The last and fourth group of the children fed with the *Sattu* which was prepared with gram, barley and maize.

Table 2 shows the nutritive value of different trials. It is clear from the table that the trials no. 2 and 3 are better than the other technology options 1 and 4 with respect to protein and energy, calcium and iron content. As we know that the problem of malnutrition is basically due to protein and energy imbalance, so it can be interpreted from the table that if *Sattu* will be prepared with the ingredients like soybean, it will produce a desirable and positive effect on the health of the children and the problem of malnutrition can be mitigate to the greater extent.

Table 3 shows the acceptability of the modified *Sattu* in different combinations. The acceptability of the *Sattu* was prepared by comparing the locally practice on the dimensions like, colour, flavour, texture, taste and appearance. It is clear from the Table 3 that, *Sattu* if prepared with maize and soybean combination, was more acceptable between the beneficiaries in comparison to *Sattu* which was prepared with only gram and gram, barley and maize.

With respect of color, treatment 3 *i.e.* *Sattu* prepared with gram and maize ranked 1st, followed by treatment 3, 4 and 1. For the flavour, again treatment 2 ranked 1st treatment 3 and 4 ranked at equal in terms of flavour and farmer’s practice was stand at last.

Treatment 2 and 3 shared the same place with respect to texture, followed by treatment 4 and 1. For the taste, treatment

Table 1. Comparative analysis of blood protein value of children who were receiving the treatment

Group No.	Total protein- 6-8 g/dl (mean value)		% change	Albumin-3.7-5.3 g/dl (mean value)		% change	Globulin-2.3-3.6 g/dl (mean value)		% change
	Pre (Mean)	Post (Mean)	(Mean)	Pre (Mean)	Post (Mean)	(Mean)	Pre (Mean)	Post (Mean)	(Mean)
Group - 1 (Farmer's practice)	7.36	7.66	30.0	4.25	4.44	19.0	2.42	2.61	19.0
Group - 2 (Gram+Maize)	6.72	7.05	33.0	4.28	4.48	20.0	3.11	3.38	27.0
Group - 3 (Gram+Maize+Soybean)	6.52	6.93	41.0	4.10	4.34	24.0	2.44	2.95	51.0
Group - 4 (Gram+Barley+Maize)	7.38	7.73	35.0	4.40	4.61	21.0	2.97	3.18	21.0

Table 2. Nutritive values of different technology options (per 100 g)

Sr. No.	Technology options	Protein	Fat	Carbohydrate	Energy	Calcium	Iron	Rank
1.	T ₁ (Farmer's practice)	18.52	4.64	60.87	359.55	41.2	6.99	3 rd
2.	T ₂ (Gram+Maize)	21.36	5.03	58.91	366.30	53.2	8.78	1 st
3.	T ₃ (Gram+Maize+Soybean)	24.36	7.74	52.28	370.20	84.8	8.24	2 nd
4.	T ₄ (Gram+Barley+Maize)	18.02	4.10	62.02	357.80	42.0	6.49	4 th

Table 3. Acceptability index*

Sr. No.	Technology options	Colour	Flavour	Texture	Taste	Appearance	Overall acceptability	Rank
1.	T ₁ (Farmer's practice)	6.3	6.1	6.5	6.6	6.2	6.34	4 th
2.	T ₂ (Gram+Maize)	7.6	7.9	7.7	8.4	7.8	7.88	1 st
3.	T ₃ (Gram+Maize+Soybean)	7.4	7.6	7.7	8.6	7.9	7.84	2 nd
4.	T ₄ (Gram+Barley+Maize)	6.9	7.6	7.2	7.6	7.2	7.30	3 rd

*The index was prepared on 10 point continuum scale.

Table 4. BC ratio

Sr. No.	Technology options	Production cost (Rs. per kg)	Market cost (Rs. per cost)	Net saving (Rs.)	BC ratio	Rank
1.	T ₁ (Farmer's practice)	30	60	30	1:2	3 rd
2.	T ₂ (Gram+Maize)	32	65	33	1:2.03	2 nd
3.	T ₃ (Gram+Maize+Soybean)	36	75	39	1:2.08	1 st
4.	T ₄ (Gram+Barley+Maize)	35	70	35	1:2	3 rd

3 was ranked first followed by treatment 2, 4 and 1. Thus, treatment 3 got the highest overall acceptability followed by treatment 2, 4 and 1.

In brief, it can be concluded from the Table 3 that treatment 2 was the most accepted between the beneficiaries followed by treatment 3, 4 and 1. This trend shows that there is need to make people aware about the different combinations of the *Sattu* ingredients.

Table 4 shows the benefit cost ratio of different technology options. It is very clear from the Table 4 that the farmer's practice *i.e.*, making *Sattu* only with gram is having less benefit cost ratio instead if it is prepared with different combinations of soybean, maize and barley. The total benefit in terms of saving, treatment 2 and 3 were most suitable in comparison to treatment 4 and 1. As the rural women of Godda district also sale the *Sattu* by preparing it in the market, so it is also a very impressive result that if *Sattu* will prepare by adding

different ingredients, it will not only enhance the acceptability but also the money returns will be good.

Conclusion:

The problem of malnutrition is not only the problem of the poor countries but the other countries are also suffering from it. The only difference is the degree of malnutrition in different countries. It is much needed that despite the very painful and continuous efforts of the country, the problem of malnutrition is still prevalent in the country. So, there is a need to combat the problem of malnutrition at the grass root level, because it is well known fact that if the efforts of any programme will be taken from grass root level, the programme will be successful. Same in the case of malnutrition, it also required that the feeding pattern of the children should be improved at household level. The attention should be given to the locally available feeding materials and its consumption

patterns and there should be awareness among the people about the importance of the local foods and its nutritional value. This is the somewhat better approach to reduce the incidence of malnutrition at the grass root level and thus the child from every household will be healthy.

This study represents the Godda block of Godda district, Jharkhand. The results may vary from district to district. Also, the study covered only 20 children, so there are chances of minor deviations in the results.

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